2. CONTAMINATION SITE CPP-61

Information presented in the following subsections was extracted from *Track 1 Documentation Decision Packages for WAG 3 OU 3-01 Sites CPP-49, CPP-50, CPP-51, and CPP-61* (WINCO 1992a), the Utilities Replacement Expansion Project (UREP) 18 Substation Phase II construction files currently still archived at INTEC document control, and the white paper evaluations by SAIC (SAIC 2000a).

2.1 Summary

Site CPP-61 (PCB spill in CPP-718 Transformer Yard) is the result of a transformer oil spill containing PCBs to the soil that occurred between 1982 and 1985. Figure 2-1 shows the former CPP-718 Transformer Yard fence and Site CPP-61 during the 1985 timeframe. The current infrastructure around Site CPP-61 is shown in Figure 1-1. The Track 1 decision documentation (WINCO 1992a), approved in 1993, determined that "No Further Action" was justified for the PCB oil spill. However, because of radioactive soil identified at the site, the site was referred to the WAG 3 OU 3-13 Comprehensive RI/FS (DOE-ID 1997a) for further evaluation. The radionuclides found in the soil were determined to be below risk-based soil concentrations and, therefore, require no further action based on the baseline risk assessment (BRA) in the RI/BRA (DOE-ID 1997b). At the time of issuing the OU 3-13 ROD (DOE-ID 1999), Site CPP-61 was transferred to OU 3-14 for further evaluation based on uncertainty with regard to the extent, if any, of PCB contamination that may remain under the existing concrete transformer pad.

2.2 Release

Site CPP-61 is the location of a 25- × 25-ft PCB-contaminated oil spill within the former CPP-718 Transformer Yard northwest of building CPP-613. The spill occurred during the UREP between the spring of 1982 and July 1985 when transformer XFR-8T2-2 operated with a 30-40% voltage overload. The overload resulted in heat expansion of the transformer oil and intermittent releases during the summer months when the transformer was maximized. Temporary measures were in place to contain the leak. These involved collecting the oil in a drip pan and then storing it in 55-gal drums. During this time period, approximately 400 gal of mineral oil with a PCB concentration of 179 ppm leaked from the transformer. The oil that was not contained contaminated the reinforced concrete pad (10 × 8 ft and 6 ft 8 in. deep) and soil adjacent to the pad, primarily on the east side (see Figure 2-2). Figure 2-2 is taken from Reference 6 in the Track 1 document (WINCO 1992a), which captured the sample locations and levels of PCB contamination. Table 2-1 presents the soil sample identification number and grid location with regard to Building CPP-613. The analytical results for PCB and sample depth in the soils, depicted in Figure 2-2, are presented in Table 2-2. Table 2-3 presents the PCB analytical results for the transformer pad.

On December 22, 1984, the transformer was drained and taken out of service. The transformer was removed and taken to a Treatment, Storage, and Disposal Facility on April 2, 1985. Cleanup activities then began in July 1985 for the concrete pad and surrounding soil.

2.3 Spill Site Description

At the time of the release, the soil in the 14,000-ft^2 transformer yard (CPP-718) was an alluvial deposit of sand, silt, and gravel with increasing gravel content with depth. A 3-4-in. layer of gravel laid on top of the soil. The grounding grid was located 18-24 in. below the surface of the soil.

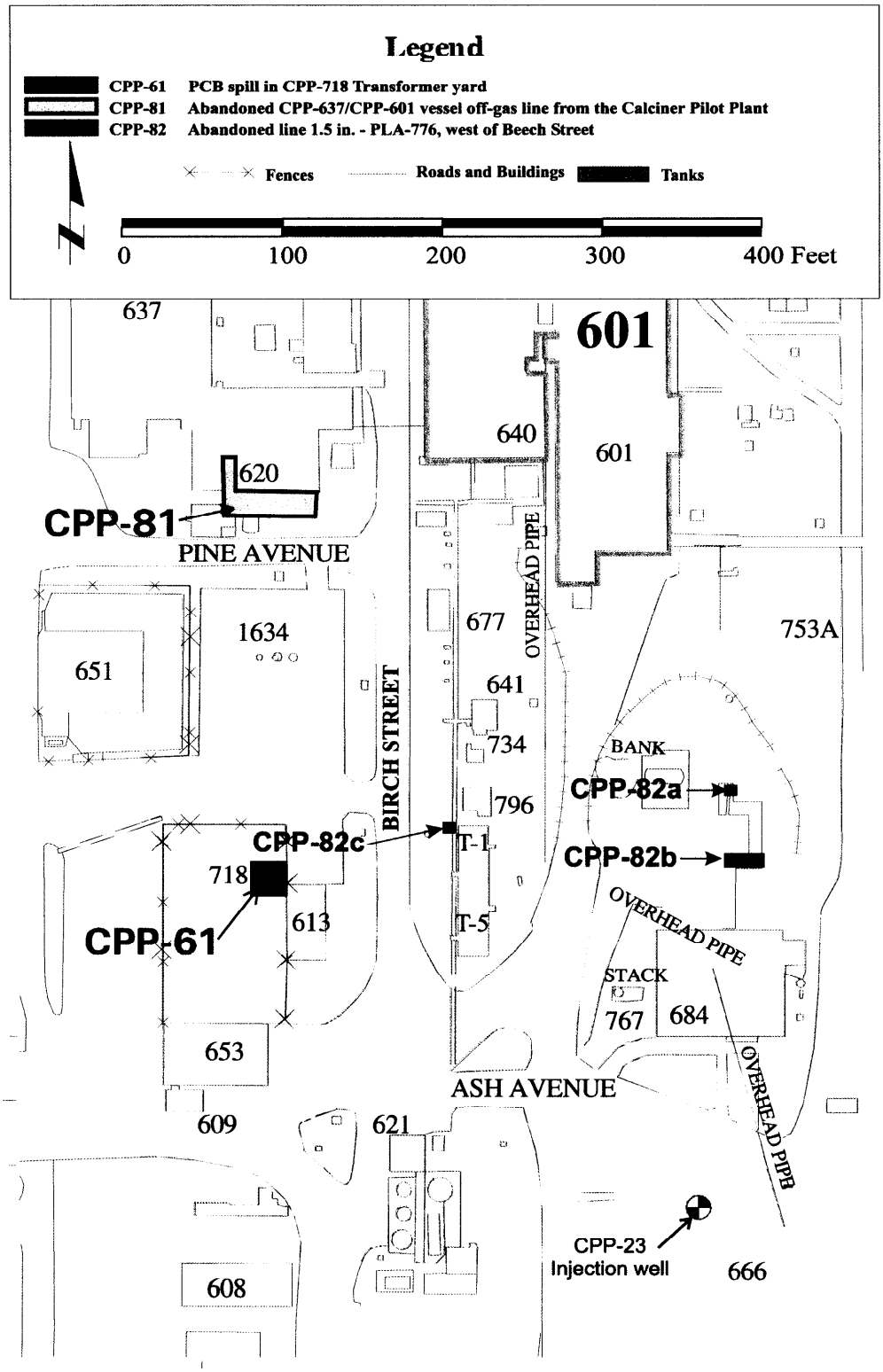

Figure 2-1. Map of INTEC showing CPP-718 and soil Sites CPP-61, CPP-81, and CPP-82 (1994-5 site plan).

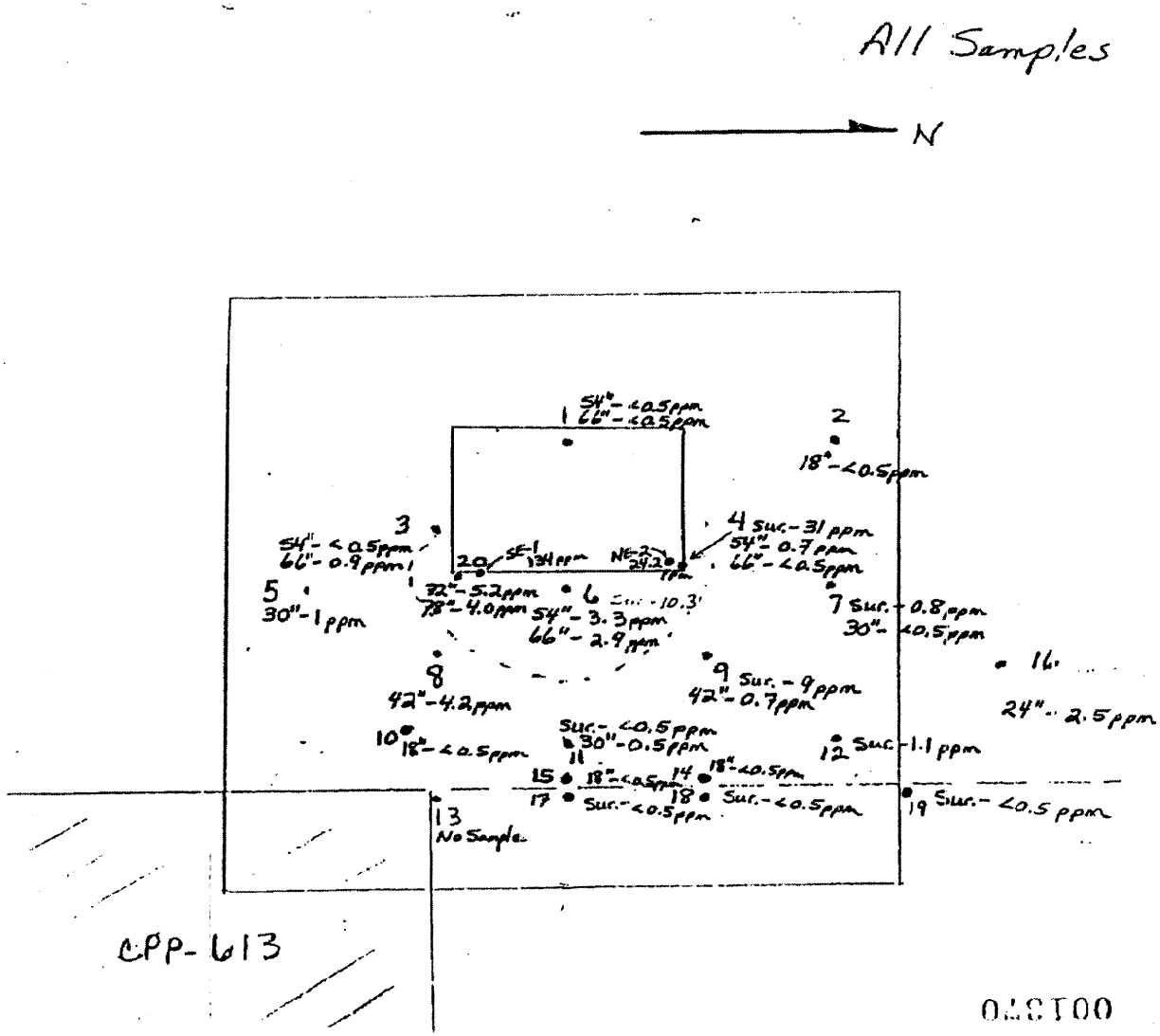

Figure 2-2. Sketch of Site CPP-61, sample locations, and analytical results prior to cleanup. (WINCO 1992a)

Table 2-1. Soil sample numbers and grid location from the northwest corner of Building CPP-613.

Sample No.	Coordinates re NW Corner of CPP-613
1	6 ft N 16 ft 8 in. W
2	14 ft N 16 ft 8 in. W
3	2 ft N 12 ft 6 in. W
4	10 ft N 12 ft 6 in. W
5	2 ft S 9 ft 2 in. W
6	6 ft N 9 ft 2 in. W
7	14 ft N 9 ft 2 in. W
8	2 ft N 5 ft 10 in. W
9	10 ft N 5 ft 10 in. W
10	2 ft S 4 ft W
11	6 ft N 1 ft 8 in. W
12	14 ft N 1 ft 8 in. W
13	2 ft N 1 ft 3 in. E
14	10 ft N 1 ft 3 in. W
15	6 ft N 1 ft W
16	24 ft 10 in. N 5 ft 5 in. W
17	6 ft N 1 ft E
18	10 ft N 1 ft E
19	16 ft N 1 ft E
20	2 ft N 10 ft W

Table 2-2. Detected PCB contamination (ppm) prior to cleanup.

Sample No./ Depth	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Surface	—	—	—	31	—	—	0.8	—	9	—	<0.5	1.1	NS	—	—	—	<0.5	<0.5	<0.5	—
18 in.	—	<0.5	—	—	—	—	—	—	—	<0.5	—	—	—	<0.5	<0.5	—	—	—	—	—
30 in.	—	—	—	—	1	—	<0.5	—	—	—	0.5	—	—	—	—	—	—	—	—	—
24 in.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.5	—	—	—	—
42 in.	—	—	—	—	—	—	—	4.2	0.7	—	—	—	—	—	—	—	—	—	—	—
54 in.	<0.5	—	<0.5	0.7	—	3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
66 in.	<0.5	—	0.9	<0.5	—	2.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
72 in.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.2
78 in.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4

Note:
— = no samples taken at this depth.
NS = No samples taken at this location.

Table 2-3. Transformer pad sample location and PCB concentration prior to cleanup.

Sample No.	Location	PCB (ppm)
1	SE corner	134
2	NE corner	24.2

The 10- × 8-ft transformer pad was constructed of reinforced concrete. It was 9 in. thick and supported 9 in. abovegrade. The foundation was 5 ft below grade and the stem walls were 15 in. wide for a 7.5- × 8-ft area under the concrete pad (see Figure 2-3).

2.4 Spill Response

In July 1985, the cleanup of PCB spill Site CPP-61 was initiated. Response to the PCB spill was addressed as part of the project known as UREP Substation Phase II or UREP 18. The scope of work (Reference 2, WINCO 1992a) included, but was not limited to

- Remove and dispose of the concrete transformer pad (concrete and rebar) that transformer XFR-8T2-2 was sitting on
- Remove PCB-contaminated gravel and dirt in the yard in the vicinity of the XFR-8T2-2 pad
- Provide PCB sampling and analysis for the transformer, the oil removed from the transformer, transformer accessories, and gravel and dirt in the yard area in the vicinity of the XFR-8T2-2 pad.

Prior to ascertaining the extent of the PCB release, health physicists surveyed the surface soils and concrete transformer pad for radioactivity. Nine contaminated hot spots were detected with activities significantly higher than the 200 counts per minute (cpm) background levels. Two hot spots were also detected on the concrete pad. Radioactively contaminated soil and concrete were removed from the transformer yard and disposed of as low-level waste.

Cleanup guidelines ("Procedure for Removal of Radioactive Contamination Areas from Concrete Pad") for both radioactive and PCB contamination were developed and approved. See Reference 1 of WINCO (1992a) for this documentation. The procedure required cleanup monitoring by nuclear and industrial safety (N&IS) and health physics (HP) personnel. During this time, the Environmental Protection Agency (EPA) Region X Office in Seattle was notified, through the Department of Energy Idaho Operations Office (DOE-ID), of the spill and approved of the cleanup plan. The plan called for the removal of any PCB-contaminated soil with a concentration greater then 10 ppm. This information can be found in Reference 3, WINCO (1992a). A June 26, 1985, WINCO letter, Pal-15-85, documents that the "Procedure for Cleanup of PCB Contaminated Material," UREP Substation Phase II, was hand-carried to DOE-ID on June 26, 1985 (see Appendix A).

The document "Guidelines for the Cleanup of the PCB Spill From the Transformer Near CPP-613" was developed from the guidelines stated in a June 3, 1985, WINCO letter, Wrg-17-85. This guideline document was not included with the Track 1 (WINCO 1992a). Appendix A of this report presents this and other related documents. These are referenced in a July 10, 1985, Construction Interface Document, Subject: "Remove PCB/Radioactive Contaminated Soil and XRF Pad 2" (see Appendix A). This guideline document clearly discusses how the contaminated gravel and soil were removed, handled, and sampled. "Soil shall be removed to at least 8 inches below the deepest signs of contaminated oil or contamination greater than or equal to 10 ppm. The excavation will also extend laterally at least 3 feet beyond the area that is visibly contaminated."

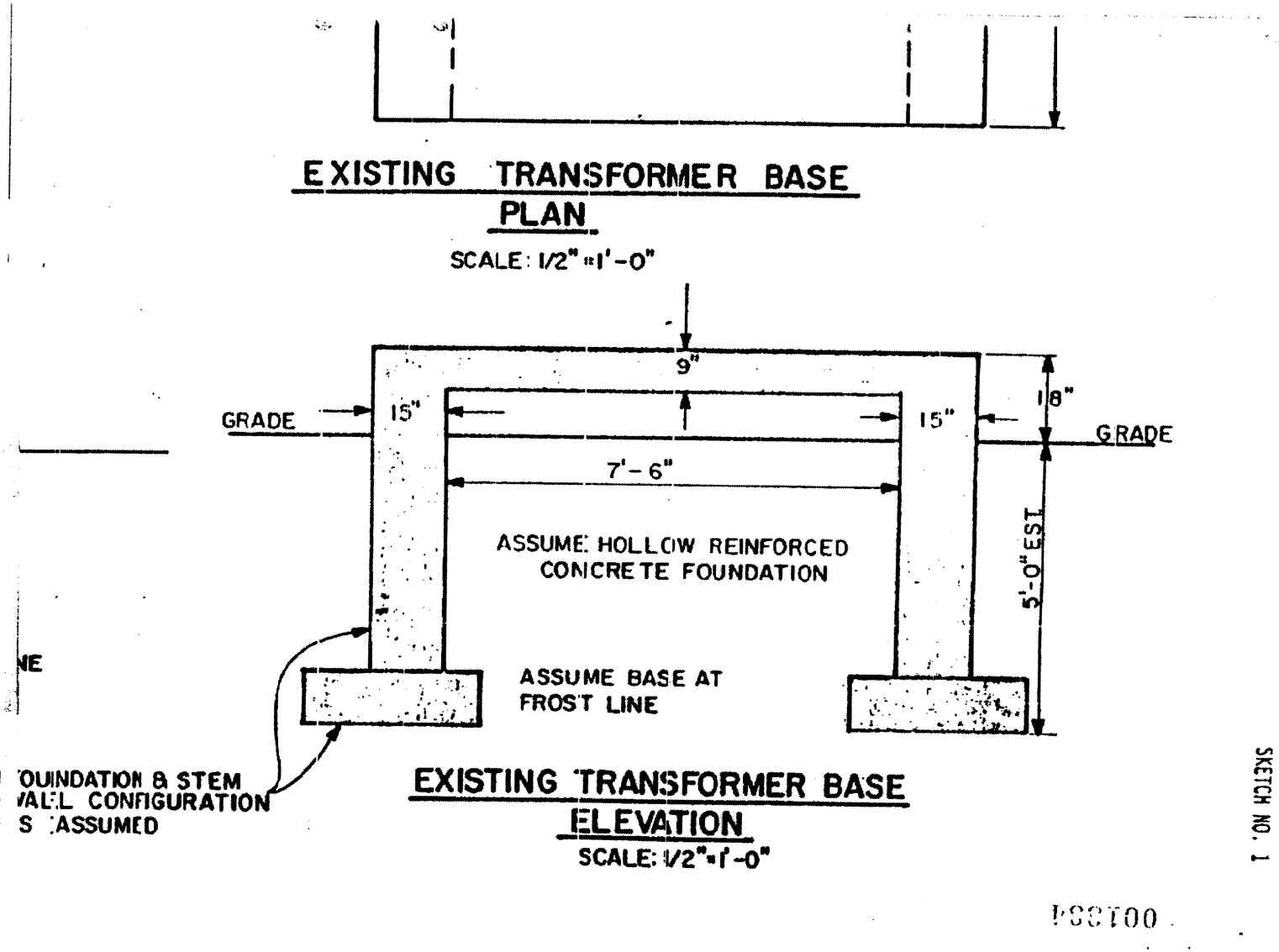

Figure 2-3. Original transformer pad XRF-8T2-2, removed in July 1985.

A sampling program (compliant with the Toxic Substances Control Act [TSCA] [15 USC 2601 et seq.] and suggested by EPA) was designed to determine the lateral and vertical extent of PCB soil contamination. In July 1985, 30 samples were collected and analyzed for PCBs. In each case, the surface of the soil beneath the overlying gravel was sampled and examined for oil. Oil-stained soil was visually observed in the top 8 in. of soil in the area to the east of the transformer pad. A PCB concentration of 31 ppm was detected in one surface soil sample collected adjacent to the northeast corner (sample location #4) of the pad. For the same location at a depth of 4 ft 6 in. and at 5 ft 6 in., the PCB concentrations were 0.7 ppm and <0.5 ppm, respectively. Adjacent to the southeast corner (sample location #20) of the pad, the PCB concentrations were 5.2 and 4.0 ppm at 6 ft and 6 ft 5 in., respectively. PCB concentrations in all other samples were less than 10 ppm; the deepest soil samples were approximately 5 ppm; the vertical profile of samples typically shows a decreasing PCB concentration with depth; PCB concentrations were below detection (0.5 ppm) in 11 samples. Sampling results and locations are provided in in References 5 and 6 of WINCO (1992a).

Excavation is reported to have been completed to a depth of 6 ft. Soil to the east of the transformer pad was removed and disposed of as PCB waste to a depth of 18 in. Below 18 in., soil was removed and characterized in 1-ft increments by N&IS personnel. After analysis, each increment was disposed of in accordance with EPA Region X guidelines. Soil with PCB concentrations less than 10 ppm was used as backfill, and soil with PCB concentrations greater than 10 ppm was packaged and shipped off-Site for disposal. All soil below 6 in. deep on the north, south, and west sides of the concrete pad contained no significant PCB concentrations (<10 ppm) and was used as backfill. The concrete transformer pad was removed intact on December 13, 1985, and disposed of off-Site as PCB waste. About 40 drums of PCB-contaminated soil and debris were disposed. This information is attached as Reference 3 in WINCO (1992a).

Where the original concrete pad's configuration was that of a hollow concrete foundation (Figure 2-3), any contaminated soils below the pad would be accessible during the excavation. Figure 2-4 shows the XFR-8T2-2 transformer location, site of the original concrete pad that was removed. The grounding grid for CPP-718 and CPP-613 is also shown. The "Daily Construction Log" for the UREP SS Phase II project dated July 25, 1985, clearly states that the contractor M-K could not lift the pad (the old pad) due to soil between the foundation walls. They removed a section of the east fence (fence around CPP-718 Transformer Yard) so dirt between the foundation walls could be removed with a backhoe. After the dirt was removed, the pad was lifted onto a truck (see Appendix C). Removal of the concrete transformer pad is discussed as being removed from the "hole." This "hole" would have been created by the removal of the contaminated soil around the pad and any under the pad, see Appendix C, Daily Construction Log, dated July 29, 1985. Pictures of the pad being removed are found in Reference 10 of WINCO (1992a).

2.5 Documentation History

The Track 1 decision documentation (WINCO 1992a) approved in 1993 determined that no further action is required with regard to Site CPP-61. This determination was evaluated and approved by DOE-ID, Idaho Department of Environmental Quality (IDEQ), and EPA Region X. The decision to transfer this "No Further Action" site to OU 3-14 in the OU 3-13 ROD was based on uncertainties regarding the extent, if any, of PCB contamination that may remain under the existing concrete pad.

2.6 Subsequent CPP-61 Site Activities

During May and June 1995, soil samples were collected from Site CPP-61, as part of the WAG 3 Comprehensive RI/FS (DOE-ID 1997b), for radionuclide analysis. The samples were analyzed and then stored as investigation-derived waste (IDW) at INTEC. Prior to disposition of the samples, a hazardous

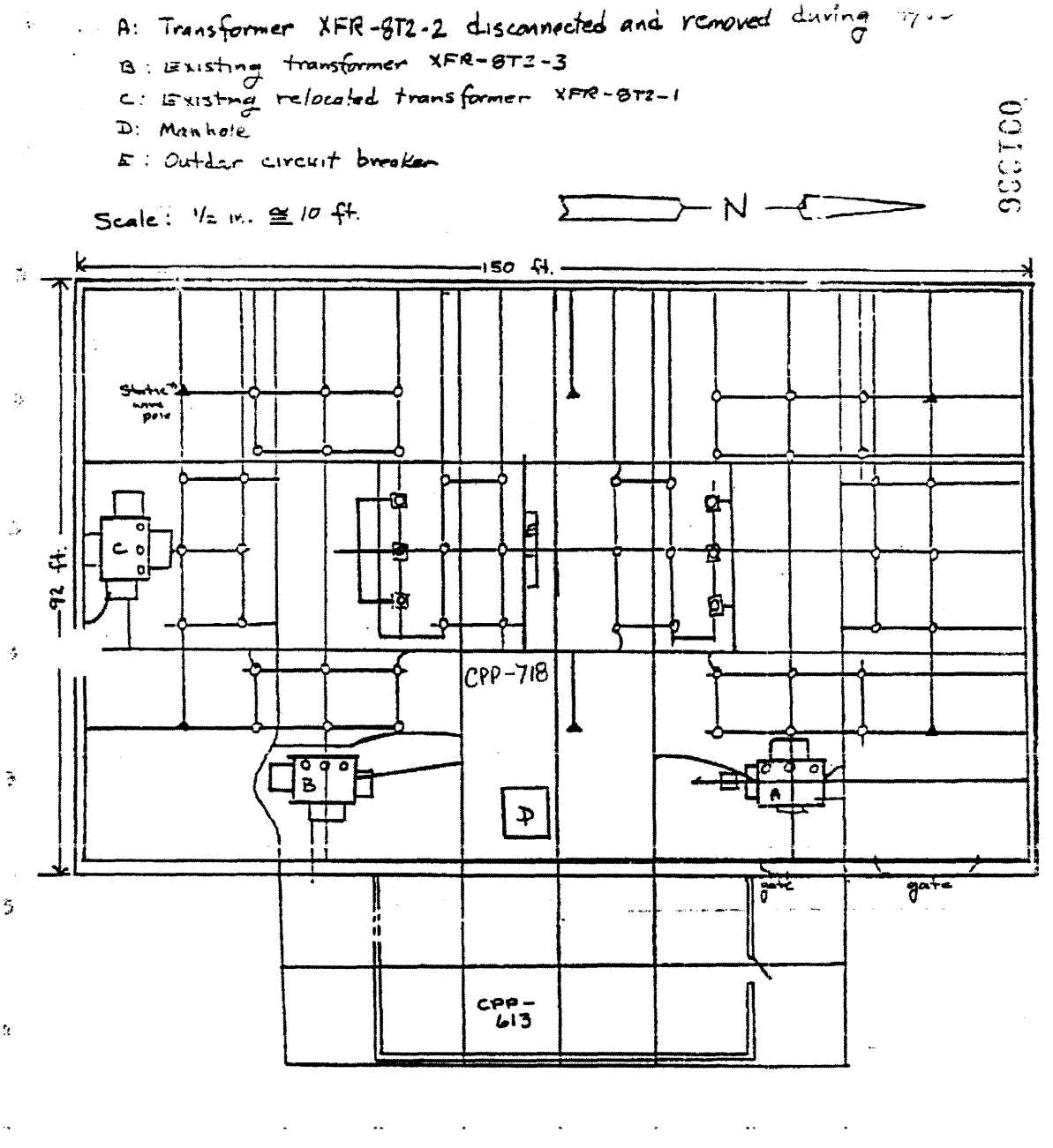

Figure 2-4. Location of XFR-8T2-2 and grounding grid with respect to CPP-718 and CPP-613.

waste determination (HWD) was performed in April 1997 and, in October 1997, the samples were analyzed for PCBs (EMI 1997). Only one sample had analytical results, exhibiting a detectable PCB concentration of ≤ 0.106 ppm (Raunig 1998). The samples were returned to the point of origin based on the HWD.

After the characterization and cleanup of Site CPP-61, a second concrete transformer pad was poured on August 12, 1985, and is still present at Site CPP-61 (see Figure 2-5). See Appendix B for photographs of the concrete forms and hole where the pad was poured. The surface area of this newer pad is approximately 6 × 9 ft. The transformer formerly supported by this newer pad has been taken out of service and removed. The fence that surrounded the former CPP-718 Transformer Yard has also been removed (see Figure 1-1).

Pictures of the concrete forms in the "hole" for the new pad, XFR-8T2-4, are included in Appendix B of this report. This demonstrates that the soil in and around the original transformer pad was removed and placed in segregated piles as discussed in the cleanup documents. Site restoration, discussed in the guidelines, addressed backfilling with low-level contaminated gravel, PCB-contaminated gravel (<10 ppm PCB), and clean gravel. The "Daily Construction Log" dated July 29, 1985, states, "N&IS (Nuclear and Industrial Safety) would not let Priest Electric remove any of the dirt from the transformer pad hole until they had an analysis report back from (on) the material at the lowest point of excavation. N&IS changed their minds about noon to let them (Priest Electric) remove any of the loose material in the hole and stockpile it, but not to dig any deeper" (see Appendix C).

2.7 Site Evaluation

Decision drivers for the Track 1 (WINCO 1992a) included the guidance provided by OSWER Directive 9355.4-01, *Guidance on Remedial Actions for Superfund Sites with PCB Contamination* (EPA/540/G-90/007) (EPA 1990), which recommends cleanup at industrial areas to a level of ≤ 25 ppm PCBs by weight in soil. The recommended cleanup levels are based on and dependent upon site-specific risk and anticipated future land use.

Spills involving PCBs that occurred before the effective date of the TSCA Spill Cleanup Policy (i.e., before May 4, 1987) must be remediated according to requirements determined by the appropriate EPA Regional Office on a site-specific basis. The spill at Site CPP-61 occurred during 1982 and 1985. In 1985, it was agreed with the EPA Region X Office to clean the site to ≤10 ppm PCB.

TSCA requirements for recent (i.e., after April 2, 1987) low-concentration spills (≥50 ppm but <500 ppm) covers ≥ 1 lb of PCBs or ≥ 270 gal of untested mineral oil. PCB spill cleanup regulations (40 CFR 761.125) apply "to all spills of PCBs at concentrations of 50 ppm or greater..." and, based on Site CPP-61 characterization (maximum detected PCB sample of 31 ppm), are not explicitly applicable.

The TSCA cleanup criteria for recent low-concentration PCB spills are presented below:

- Spills of PCBs that occur in outdoor electrical substations must have contaminated soil cleaned to a concentration of ≤25 ppm (i.e., residual PCBs in soil must be ≤25 ppm PCB).

- Spills that occur in a restricted access boundary must have contaminated soil excavated to a level of 25 ppm or less.

- Spills that occur in a non-restricted access location must have contaminated soil cleaned to a level of ≤10 ppm PCB provided that the soil has been excavated to a depth of at least 10 in. and the soil has been replaced with clean fill containing <1 ppm PCB.

2.7.1 Nature and Extent of Remaining Contamination

- There is no evidence of migration from the site during the cleanup. This is consistent with the nature of PCBs. PCBs adhere to particles and the organic content of the soil/sediment; they generally do not leach significantly in aqueous soil systems.

- The sampling profile showed the pattern of PCB distribution in the soil to be restricted to the area of the immediate spill (Figure 2-2). This is documented in the Track 1 (WINCO 1992a).

- The cleanup around the original pad included all soil that extended laterally at least 3 ft beyond an area with visible contamination in accordance with the cleanup guidelines (Appendix A).

- PCB-contaminated soil with a concentration greater than 10 ppm was removed and properly disposed of in the cleanup. The soil used as backfill at the site contained ≤10 ppm PCB. There is no empirical evidence to support concerns that PCB concentrations below the current pad would exceed the concentrations allowed for backfill soil (i.e., ≤10 ppm). Next to the southeast corner of the pad where the deepest sample was taken, sampling location #20 (Figure 2-2 and Table 2-2) contained 5.2 ppm PCB at the 72-in. depth and 4 ppm PCB at the 78-in. depth.

2.7.2 PCB Risk

To assess the risk at CPP-61 from PCB-contaminated soil at levels ≤10 ppm, the preliminary remediation goals (PRGs) from EPA Region IX were used (EPA 2000). The PRGs are Agency guidelines, not legally enforceable standards. They are used for site "screening" and as initial cleanup goals if applicable.

The PRGs contained in the Region IX PRG table are generic; they are calculated without site-specific information. They can be used to screen a site to determine whether further evaluation is appropriate. Exceeding a PRG suggests that further evaluation (i.e., additional sampling) of the potential risks that may be posed at the site is appropriate. Region IX PRG concentrations are based on exposure pathways for which generally accepted methods, models, and assumptions have been developed (i.e., ingestion, dermal contact, and inhalation) for specific land-use conditions and do not consider impact to groundwater or ecological receptors. The PRGs are chemical concentrations that correspond to fixed levels of risk [i.e., either a one-in-one-million (10^{-6}) cancer risk or a noncarcinogenic hazard quotient (HQ) of 1 in soil, air, and water]. Under the CERCLA program, cleanup decisions are generally made at carcinogenic excess risk levels that are in excess of one in 10,000 (10^{-4}). For risk levels between one in 10,000 (10^{-4}) and one in 1,000,000 (10^{-6}), the Agencies make a risk management decision regarding the appropriate level of remedial action required. Table 2-4 depicts the EPA Region IX PRG concentrations associated with PCBs for a residential scenario and the HQ equal to 1. This table provides the calculations for Aroclor 1254. Aroclor 1254 has the most conservative PCB concentrations for carcinogenic risk and noncarcinogenic hazard quotient.

Table 2-4. PCB (Aroclor 1254) concentrations (mg/kg [ppm]) for residential soil--cancer risk and HQ = 1 (adapted from EPA 2000).

	Integrated Cancer Risk			HQ = 1
Contaminant	1E-06 (mg/kg)	1E-05 (mg/kg)	1E-04 (mg/kg)	Integrated (mg/kg)
Aroclor 1254	2.2E-01	2.2E-00	2.2E+01	1.1E+00

In review of the information presented in Sections 2.7 and 2.7.1, the risk represented by the PCB contamination at CPP-61 is within the acceptable limits for an integrated cancer risk of 1E-04 (2.2 ppm) for a residential scenario. The following summarizes information supporting this conclusion:

- Review of the PCB concentration levels detected in the soil prior to cleanup (see Table 2-2) shows that most of the contamination is <0.5 ppm and the maximum PCB concentration at depth was 5.2 ppm.

- Cleanup guidelines were developed to address the PCB spill and construction logs and photographs used to document the process of soil excavation and backfill. The cleanup guidelines state that soil "shall be removed to at least eight (8) inches below the deepest signs of contaminated oil or contamination greater than or equal to 10 ppm" and that the excavation "will also extend laterally at least three (3) feet beyond the area that is visibly contaminated." The guidelines also state that gravel on the east side of the pad where the spill was located would be excavated to 6-18 in. deep and placed in barrels for disposal. The guidelines go on to say that soil below 18 in. would be removed in 1-ft increments and segregated into piles until a determination could be made that the soil contained less than 10 ppm PCBs and could be used as backfill. Finally, the guidelines state that restoration of the site would be completed with the placement of a surface layer of "clean gravel to the level of the surrounding area."

- Construction logs indicate that the guidelines for cleanup of the PCB-contaminated soils were followed. The July 8-12 entry reflects discussions about removal of contaminated gravel. The July 22-25 entries state that soil on the east side of the pad was excavated in 1-ft increments and that extensive excavation continued to the depth required for the new pad and in order to dislodge the foundation walls. The July 29 entry indicates that the lowest point of the excavation was analyzed for PCBs, and the August 16 entry suggests that excavated soil was sampled prior to release as backfill (see Appendix C).

- There were forty 55-gal drums of soil and debris that were removed from the site during cleanup and disposed of at an off-Site location, thus the PCB concentration in the backfill used at CPP-61 is probably closer to <1 ppm than to ≤10 ppm.

- Soil samples were taken after the cleanup to evaluate the extent of radioactive contamination as part of the OU 3-13 RI/BRA. The RI/BRA Report documents that a borehole was drilled as close as possible to the original PCB spill in the locations of the 1,000 and 1,500 cpm readings detected in 1985 (DOE-ID 1997b). A HWD was made for the IDW from the RI/BRA investigations and only one sample showed detectable PCB concentration at less than or equal to 0.106 ppm (Raunig 1998).

- The site also meets the current TSCA PCB requirements for decontaminating spills in nonrestricted access locations. This requires PCB contamination in soil to be less than or equal to 10 ppm provided that there are 10 in. of clean surface soils (less than 1 ppm).

There are no data indicating that the existing soil exceeds the PCB HQ of 1 (1.1 ppm). Given the nature of the cleanup, however, it is possible that the contaminated soil at depth could have levels of PCB contamination of up to 10 ppm. When an HQ of 1 is exceeded, a review of the level of risk is performed and supporting information is reviewed. For example, an HQ of 10,000 may be considered to pose an immediate and very unacceptable risk that may warrant immediate action, while an HQ <0.1 may immediately support a no further action (NFA) management decision. One aspect of this review includes other relevant and appropriate requirements that may provide information on the level of cleanup that is required. This includes a review of current EPA TSCA standards for cleanup of soil following a spill of

material containing more than 50 ppm PCBs. This standard indicates that soil in areas of unrestricted access at which a spill occurs can be decontaminated to 10 ppm by excavating at least 25 cm (10 in.) of soil and backfilling with material containing less than 1 ppm PCBs. Because this current TSCA cleanup standard was met for this site, it can be inferred that acceptable remediation has already occurred.

Several uncertainties are associated with the available information concerning the removal of the PCB contamination that occurred in 1985. These uncertainties include the following:

- The lack of detailed information on the depth and extent of the excavation that was performed to remove the pad. Based on existing information, it appears reasonable that the excavation extended to a minimum depth of 6 ft to remove the concrete slab.

- While PCB-contaminated soils in excess of 10 ppm were removed, the specific level and extent of PCB contaminants remaining in the undisturbed soil and the soil used for backfill (that are less than the 10 ppm) is not know. Analytical results from the backfill soil detected a maximum PCB concentration PCB concentration of 0.106 ppm.